

Claims

What is claimed is:

1. A method of filtering pixels of a video frame of a sequence of video frames, said method comprising:

determining a pixel value difference between a pixel of a current frame and a corresponding pixel of a temporally previous frame; and

adaptively filtering said pixel of said current frame using a filter coefficient, said adaptively filtering comprising employing said pixel value difference to select said filter coefficient for use in filtering said pixel.

2. The method of claim 1, wherein the adaptively filtering comprises employing at least one threshold and at least two filter coefficients, wherein said filter coefficient is automatically selected by said adaptively filtering from said at least two filter coefficients depending upon said pixel value difference relative to said at least one threshold.

3. The method of claim 2, wherein said adaptively filtering further comprises programmably, adaptively filtering said pixel of said current frame using said filter coefficients, and wherein at least one of said at least one threshold and said at least two filter coefficients can be programmably varied.

4. The method of claim 2, wherein the at least one threshold comprises a first threshold and a second threshold, and wherein the at least two filter coefficients comprises a first filter coefficient, a second filter coefficient and a third filter coefficient, wherein said first filter coefficient is selected by the adaptively filtering if the pixel value difference is below said first threshold, said second filter coefficient is selected by the adaptively filtering if the pixel value difference is between said first threshold and said second threshold, and said third filter coefficient is selected by the adaptively filtering if the pixel value difference is greater than said second threshold.

5. The method of claim 1, wherein said adaptively filtering further comprises outputting a filtered pixel value (FPV), wherein said FPV is determined by:

$$FPV = P1(f) + P2(1-f)$$

wherein:

P1 = pixel value of a current pixel

P2 = pixel value of the corresponding (x,y) pixel in the temporally previous frame

f = selected filter coefficient.

6. The method of claim 1, further comprising implementing said method within temporal filter logic integrated with a repeat field detection unit of a video encoder.

8. A system for filtering pixels of a video frame of a sequence of video frames, said system comprising:

a temporal filter, said temporal filter comprising:

means for determining a pixel value difference between a pixel of a current frame and a corresponding pixel of a temporally previous frame; and

means for adaptively filtering said pixel of said current frame using a filter coefficient, said means for adaptively filtering comprising means for employing said pixel value difference to select said filter coefficient for use in filtering said pixel.

9. The system of claim 8, wherein said means for adaptively filtering comprises means for employing at least one threshold and at least two filter coefficients, wherein said filter coefficient is automatically selected by said means for adaptively filtering from said at least two filter coefficients depending upon the pixel value difference relative to the at least one threshold.

10. The system of claim 9, wherein said means for adaptively filtering further comprises means for programmably, adaptively filtering said pixel of said current frame using said filter coefficients, and wherein at least one of said at least one threshold and said at least two filter coefficients can be programmably varied.

11. The system of claim 9, wherein the at least one threshold comprises a first threshold and a second threshold, and wherein said at least two filter coefficients comprise a first filter coefficient, a second filter coefficient, and a third filter coefficient, wherein said first filter coefficient is selected by said means for adaptively filtering if the pixel value difference is below said first threshold, said second filter coefficient is selected by the means for adaptively filtering if the pixel value difference is between said first threshold and said second threshold, and said third filter coefficient is selected by the adaptively filtering if the pixel value difference is greater than said second threshold.

12. The system of claim 8, wherein said adaptively filtering further comprises means for outputting a filtered pixel value (FPV), wherein said FPV is determined by:

$$FPV = P1(f) + P2(1-f)$$

wherein:

P1 = pixel value of a current pixel

P2 = pixel value of the corresponding (x,y) pixel in the temporally previous frame

f = selected filter coefficient.

13. The system of claim 8, further comprising a repeat field detection unit for a video encoder, and wherein said temporal filter is integrated with said repeat field detection unit.

14. The system of claim 13, wherein said means for determining of said temporal filter comprises memory fetch logic and difference calculation logic within the repeat field detection unit, said memory fetch logic comprising means for fetching said corresponding pixel of a temporally previous frame, and said difference calculation logic comprising means for calculating said pixel value difference.

15. At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of filtering pixels of a video frame of a sequence of video frames, said method comprising:

determining a pixel value difference between a pixel of a current frame and a corresponding pixel of a temporally previous frame; and

adaptively filtering said pixel of said current frame using a filter coefficient, said adaptively filtering comprising employing said pixel value difference to select said filter coefficient for use in filtering said pixel.

16. The at least one program storage device of claim 15, wherein said adaptively filtering comprises employing at least one threshold and at least two filter coefficients, wherein said filter coefficient is automatically selected by said adaptively filtering from said at least two filter coefficients depending upon the pixel value difference relative to the at least one threshold.

17. The at least one program storage device of claim 16, wherein said adaptively filtering further comprises programmably, adaptively filtering said pixel of said current frame using said filter coefficients, and wherein at least one of said at least one threshold and said at least two filter coefficients can be programmably varied.

18. The at least one program storage device of claim 16, wherein the at least one threshold comprises a first threshold and a second threshold, and wherein the at least two filter coefficients comprises a first filter coefficient, a second filter coefficient and a third filter coefficient, wherein said first filter coefficient is selected by the adaptively filtering if the pixel value difference is below said first threshold, said second filter coefficient is selected by the adaptively filtering if the pixel value difference is between said first threshold and said second threshold, and said third filter coefficient is selected by the adaptively filtering if the pixel value difference is greater than said second threshold.

19. The at least one program storage device of claim 15, wherein said adaptively filtering further comprises outputting a filtered pixel value (FPV), wherein said FPV is determined by:

$$FPV = P1(f) + P2(1-f)$$

wherein:

P1 = pixel value of a current pixel

P2 = pixel value of the corresponding (x,y) pixel in
the temporally previous frame

f = selected filter coefficient.

20. The at least one program storage device of claim 15, further comprising automatically repeating said determining and said adaptively filtering for pixels of multiple video frames of the sequence of video frames.

* * * * *